DOCUMENT RESUME

ED 160 691 UD 018 631

AUTHOR Smith, James P.
TITLE The Convergence to Racial Equality in Women's Wages. P-6026.
INSTITUTION Rand Corp., Santa Monica, Calif.
PUB DATE Mar 78
NOTE 57p.; Pages 43 and 44 will be marginally legible due to print size of the original document
AVAILABLE FROM The Rand Corporation, 1700 Main Street, Santa Monica, California 90406 ($5.00)

EDRS PRICE MF-$0.83 HC-$3.50 Plus Postage.
DESCRIPTORS Affirmative Action; *Black Employment; Census Figures; Cohort Analysis; Comparative Analysis; Domestics; *Equal Opportunities (Jobs); *Racial Differences; *Socioeconomic Status; Statistical Analysis; *Wages; *Working Women

ABSTRACT

Using statistical analyses of 1960 and 1970 census data, this paper explores reasons for the remarkable rise in the relative wage of black women in the United States. Education, government employment, geographical region of residence (South or non-South), and hours worked are the four variables employed. The analytical framework of the study is detailed. A comparison of occupational distributions reveals that the proportion of black women in domestic service has declined significantly and that over half of this decline was offset by expanded employment of blacks as clericals, secretaries and typists. More competitive (with white women) levels of schooling, the rapid rise in black wages in the South, and the success of affirmative action are cited as major reasons for the improved overall economic position of black women. (KR)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

SEP 2 0 1978

ED160691

UDO 18631

THE CONVERGENCE TO RACIAL EQUALITY IN WOMEN'S WAGES

James P. Smith

March 1978

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Rand Corporation, Santa Monica, Calif.

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

P-6026

The Rand Paper Series

Papers are issued by The Rand Corporation as a service to its professional staff. Their purpose is to facilitate the exchange of ideas among those who share the author's research interests; Papers are not reports prepared in fulfillment of Rand's contracts or grants. Views expressed in a Paper are the author's own, and are not necessarily shared by Rand or its research sponsors.

The Rand Corporation
Santa Monica, California 90406

Twenty years ago the average black woman employed full-time was earning approximately half the wage rate of a similarly employed white woman. By 1975 almost complete racial parity in female wages had been achieved. Although this remarkable advance in the economic status of black women has accelerated in the last few years, it has received little serious analytical attention. In contrast, the significant but smaller income gains of black males during the 1960s generated considerable research attempting to disentangle possible sources of this improvement. Real wage changes of the magnitude observed for black females are so rare that it seems unlikely conventional explanations will suffice. In this paper, I explore several potential reasons for the rise in the relative wage of black women.

One explanation--the vintage hypothesis-- asserts that relative to white women, more recent black female cohorts begin their job experiences with larger initial stocks of human capital than previous cohorts. As blacks and whites become increasingly alike in attributes such as education, increases in black-white female wage ratios should follow. A related factor involves enhancement in the relative quality of attributes like schooling across successive generations. Migration of blacks from low- to high-wage regions is another possible cause of rising average black wages. Historically, black migration from the South to the North was the dominant factor, but more recently urbanization of the black South has assumed an important role. Perhaps the most common explanation for the recent rise in black-white wage ratios rests on the alleged positive effects of governmental pressures commonly known as affirmative action. Title VII of the 1964 Civil Rights Act forbids both employment and wage discrimination on the basis of race and

sex, and a number of governmental agencies have been given a mandate to enforce the provisions of this legislation. Since we can directly observe wages only for working women, the time series behavior of female wage rates may be caused in part by sample composition. Wage rates of working women may be unrepresentative of the mean wage available to all women. As the proportion of women in the labor force increases over time, changes in black-white wage ratios among market participants may differ from trends in this wage ratio computed for all women. By comparing wage equations that control for censoring bias with results from simple OLS estimation, the role of censoring and sample composition in determining secular trends in female wage ratios can be evaluated. Finally, changes in other aspects of market work may be important. This includes the choice of part- or full-time work and changes in the occupational distribution of women by race. Certain occupations have unique characteristics in terms of work conditions and methods of compensation. Alongside the rapid improvement in the wages of black women, the last twenty years have witnessed a remarkable restructuring of the occupational distribution of black women.

Recent Trends in Black-White Female Wage Rates

In Table 1 wage differentials within race and sex groups for selected years are listed separately for all wage and salary workers and for those employed full-time. Relative to white males, black male earnings have gradually increased.[1] This increase was not uniform over this period, but was characterized instead by sharp cyclic swings. In particular, the rise during the 1960s and early 1970s is larger than that observed earlier. Because of differences in work effort by sex,

Table 1

RATIOS OF MEDIAN WAGE INCOMES BY RACE AND SEX FOR SELECTED YEARS, 1947-1974

A. Race Differentials Within Sex[a]

Year	All Workers		Full-time Workers	
	Black[b] Females / White Females	Black Males / White Males	Black Females / White Females	Black Males / White Males
1947	.340	.543	.543[c]	.640[c]
1951	.421	.616	N/A	N/A
1955	.433	.588	.570	.635
1959	.532	.580	.664	.612
1963	.531	.568	.636	.654
1967	.643	.639	.765	.675
1969	.721	.666	.816	.694
1973	.898	.695	.882	.719
1974	.977	.709	.941	.736
1975	.973	.734	.986	.769

B. Sex Differentials Within Race

Year	Black Females / Black Males	White Females / White Males	Black Females / Black Males	White Females / White Males
1947	.338	.538	.477[c]	.639[c]
1951	.379	.555	N/A	N/A
1955	.382	.518	.578	.644
1959	.453	.494	.658	.606
1963	.450	.581	.577	.593
1967	.524	.476	.663	.585
1969	.551	.463	.687	.584
1973	.574	.445	.690	.563
1974	.624	.453	.728	.569
1975	.610	.461	.738	.576

Source: Various Issues of Current Population Surveys

[a] Data is for all individuals 14 years old and over.

[b] Black refers to Negro and other races.

[c] Data refer to 1946 Urban and Rural Non-Farm.

interpretation of male-female wage differentials is difficult unless one controls for hours worked. The earnings ratios for full-time workers in Table 1 serve as a crude adjustment for the extent of work. Among whites, there appears to be a slight deterioration in the wages of females relative to males,[2] while the black trend is precisely the reverse. Indeed, the wage growth enjoyed by black women is large relative to all other demographic groups. Yet, it is clearly the contrast between white and black females that is extraordinary. This increase has been so persistent and continuous that it dominates all business cycle movements and time series changes in the standard set of characteristics typically included in wage functions. This expansion in black female earnings during the 1960s clearly gained impetus from the greater intensity of their labor market employment. Since 1955, the ratio of black-white female wages increased by 54 percentage points for all workers while the ratio for fully employed females increased by 37 percentage points. Although some of the improvement results from higher working hours, the size of the gain after correcting for employment is still large.

Stratification of wage ratios by age, education and employment status is useful for determining potential reasons for the rapid rise in black female wages.[3] Table 2 contains wage ratios by age and education for married spouse-present women,[4] based on the 1960 and 1970 U.S. Census. This table illustrates the care that must be exercised in selecting a definition of earnings. As a consequence of the rise in black female labor supply during the decade, the increase in relative black weekly wages is more than twice as large as that in hourly

Table 2

BLACK-WHITE MARRIED FEMALE WAGE RATIOS
IN 1960 and 1970

Age Group	Average Hourly Wage		Average Weekly Wage	
	1970	1960	1970	1960
I. All School Completion Levels				
21-30	.921	.750	.951	.674
31-40	.867	.771	.981	.760
41-50	.647	.758	.956	.701
51-60	.847	.732	.807	.602
21-60	.890	.759	.928	.694
II. Elementary School Graduates (8 years completed)				
21-30	1.00	1.08	.981	.634
31-40	.863	.824	.955	.696
41-50	.862	.810	.848	.690
51-60	.773	.955	.742	.677
21-60	.837	.872	.827	.680
III. High School Graduates (12 years completed)				
21-30	.930	.813	1.09	.765
31-40	.932	.815	1.24	.838
41-50	.990	.822	1.12	.855
51-60	.928	.965	1.15	.782
21-60	.946	.837	1.17	.823
IV. College Graduates (16 years completed)				
21-30	.959	.870	1.09	.892
31-40	.942	.872	1.24	1.12
41-50	.997	.979	1.12	.968
51-60	1.07	.874	1.15	.857
21-60	1.00	.902	1.17	.964

Source: U.S. Census 1960 and 1970.

wages. Because weekly and annual earnings confound changes in labor supply and wage rates, hourly wages will be used exclusively in this research. Black-white female wage ratios increase with education level, suggesting a greater sensitivity of observed black wages to school completion. Since this growth in relative black wages with education is more pronounced for weekly wages, a large component of the return to schooling among blacks is a result of their increased market hours. There was a clear pro-skill bias over the decade to male wage growth with college-educated black men experiencing the largest increase in wages. A similar trend exists for females except that the principal differences lies between the elementary and high school groups.

The age stratification is useful in distinguishing vintage and life cycle effects. By comparing changes in a row with those down a diagonal, between- and within-cohort changes can be separated. For male wage ratios, most of the black-white change over the decade was due to cohort improvement with the largest wage gains accruing to the most recent black male labor market entrants. There is also support for strong vintage effects for black females with the most rapid wage improvement among the youngest females. However, unlike the male income ratios, there is substantial wage gains within cohorts. Factors that operate mainly at the front end of the labor market--improving schooling quality or initial sorting of blacks into occupations with large wage growth--apparently are not the sole cause of these recent female trends.

Table 3 contains three indices of market work that describe changes in labor supply over the decade: labor force participation rates, annual

Table 3

DIMENSIONS OF LABOR SUPPLY FOR MARRIED WOMEN

	Age Groups					
	21-25	26-30	31-40	41-50	51-60	21-60
A. Weekly Labor Force Participation Rates						
1970 Whites	35.44	37.87	31.26	40.88	41.88	37.65
1970 Blacks	33.28	46.06	48.57	51.01	47.28	47.51
1960 Whites	25.94	23.93	22.59	33.18	32.53	28.11
1960 Blacks	18.22	27.35	35.46	44.43	40.74	36.90
B. Annual Hours Worked of Workers						
1970 Whites	1404.97	1499.97	1390.38	1518.59	1629.92	1508.60
1970 Blacks	1346.03	1508.36	1577.22	1538.58	1552.76	1552.41
1960 Whites	1421.58	1488.37	1425.40	1488.03	1549.24	1488.25
1960 Blacks	1103.77	1315.92	1412.24	1442.38	1366.84	1394.43
C. Proportion of Currently Working Women Who Worked Five Years Ago						
1970 Whites	14.19	44.39	57.62	64.57	78.43	60.28
1970 Blacks	18.79	41.75	61.76	72.58	76.41	62.93
D. Proportion of Non-Currently Working Women Who Worked Five Years Ago						
1970 Whites	7.19	30.95	16.78	7.74	8.89	13.86
1970 Blacks	3.24	11.73	12.69	10.16	9.93	10.51
E. Proportion of Non-Currently Working Women Who Never Worked						
1970 Whites	51.95	24.67	18.57	20.42	26.06	23.17
1970 Blacks	67.33	49.78	39.86	38.22	31.29	40.57
1960 Whites	47.32	24.22	16.39	24.23	33.24	24.47
1960 Blacks	62.92	47.03	35.38	32.71	31.80	37.52

hours worked of participants, and some measures of the persistence of labor force participation over time. Throughout most of the 20th century, participation rates of married white women have risen steadily and converged relative to those of married black females. However, during the 1960s, the expanded entry into the labor force was approximately the same for both races. Black participation rates increased more than those of white among younger women, but the ranking was reversed for older women. Important changes also occurred in the number of hours worked. In 1960, white married female participants worked almost 100 hours more than their black counterparts; by 1970, black females worked on average 50 hours more than whites.[5] Historically, black women were predominantly in part-time jobs, but in recent years they have selected occupations more likely to contain full-time work. It is often alleged that wage rates for part-time employment are lower than those available for full-time work. If true, the adoption of full-time work is a potential reason for the rising relative black female wage.

The probability of working five years ago conditional on current market work is generally higher among black females. There is also a greater proportion of black women not currently working who never worked. Current labor force status is apparently a better indicator of lifetime labor force status for black women. Relative to white women, those black women currently working remain in the labor force for longer periods of time, while black women not currently working are more likely never to have worked. This tendency for market work to be a more permanent commitment for blacks will be important in interpreting both experience effects on ages and selectivity bias in later sections.

Framework for Analysis of Census Data

As a first step towards isolating the reasons for the rise in the relative wage of black women during the 1960s, a simple wage equation was estimated for married black and white women using the 1960 and 1970 U.S. Census. The data were pooled among years (1960 and 1970) and across races (black and white). The regression format was:

$$(1) \qquad y = x'b_0 + d_1x'\delta_1 + d_2x'\delta_2 + d_1d_2x'\delta_{12} + u$$

where

$$d_1 = \begin{matrix} 1 \text{ if black} \\ 0 \text{ if otherwise} \end{matrix} \qquad d_2 = \begin{matrix} 1 \text{ if 1960} \\ 0 \text{ if otherwise} \end{matrix}$$

In this form b_0 is the parameter vector associated with x for whites in 1970, δ_1 is the black-white difference in parameters in 1970, δ_2 is the difference in white parameters between 1960 and 1970, and δ_{12} is the 1960-70 change in the black-white difference in parameters. In this completely interactive form the parameter estimates for each of the race-year groups are identical to those that would have been obtained from separate regressions performed within each group.

The dependent variable is the log of the hourly wage. The principal advantage of Census data is the large sample size that permits detailed analysis of racial wages stratified by many demographic characteristics. Its principal disadvantages are a poorly measured wage variable, as well as the absence of information on some important determinants of wages in particular market experience. To mitigate the impact of these deficiencies, I used information available in other data sets to improve the quality of the Census data. Since hourly

wage rates are not reported directly in the Census, researchers have typically calculated them by dividing last year's earnings by annual hours computed by multiplying weeks worked by hours per week. The problem is that weeks worked and hours per year are coded into broad intervals and secondly that weekly hours are hours worked during the survey week. Since in any individual week, women are often temporarily working fewer or more hours than they typically do throughout the year, serious measurement errors are imparted to the hourly wage. The Parnes data provide information on both normal and survey week hours for working women. For each survey week hour interval in the Parnes, I predicted the average normal weekly hours. Not surprisingly, at the extremes of the survey week intervals, there were substantial differences between the survey week mean and the normal hours mean. These transformed average normal hours were used to compute the hourly wage rate.[6]

The explanatory variables are divided into five classes: schooling, region, government employment, full- or part-time work, and age or experience. The schooling variable was initially divided into three segments corresponding to years of elementary, high school, and post-high school education. This spline function for schooling was linearly segmented to permit slope coefficients to differ between the three levels of schooling, but the segments were constrained to join at 8 and 12 years of schooling. Geographic location includes binary variables indicating residence in one of six Census regions.[7] Dummy variables are included if the individual resides in a standard metropolitan statistical area (SMSA), so that the omitted class refers to residents of non-metropolitan areas. In order to capture differences

between the South and the rest of the U.S. more finely, the SMSA and central city variables were interacted with age or market experience. In an attempt to capture differential payments for part-time and full-time work, a dummy variable was included indicating whether a worker worked more than 30 hours in a week.

A number of variables are added indicating whether the individual is an employee of the federal government or a state and local government and whether she worked in an industry that is regulated by the federal government or by a state government. For those who neither work for the government nor work in industries regulated by the government, two additional variables are added. One represents purchases by the federal government as a fraction of value added originating in the industry. The other is similarly defined for purchases of state and local governments. With these variables I attempt to identify wage effects of governmental attempts to enforce anti-discriminatory legislation. If black wages are affected by either working for or being regulated by the federal government or are correlated with the government's share of industry product, an argument that this legislation had an effect would seem stronger. My presumption is that the federal government can have the most immediate and direct impact on those firms most dependent on it.

Two sets of regression estimates are reported in Appendix A. The "unconstrained" include all variables for the full-interactive specification of Equation (1). This specification was too general in the sense that it allowed for parameter differences among race and year groups that apparently do not exist. The "constrained" estimates delete variables with t statistics less than $|1|$ in the unconstrained specifi-

cation or combine variables that did not statistically differ.[8] The remainder of the paper is organized as follows: The basic variables of interest are first discussed sequentially to identify important race or year movements. Next, an accounting framework is presented for assesssing the relative weight of these variables for explaining black-white trends over the decade. The following section contains a discussion of the major occupational movements between 1960 and 1970. The final section presents an assessment of the role of changes in sample composition and censoring bias.

Summary of Census Regressions

In this section, the empirical results based on the 1960 and 1970 Census regressions are presented. The discussion is organized into four subsections based on the major categories for the explanatory variables: education, region, government, and full- or part-time work. For each category, a few important findings are highlighted.

Converging Characteristics and the Role of Education

The central reason for the improved economic status of black females is that in terms of characteristics producing higher wages blacks and whites are simply becoming more alike. While this increased similarity is reflected in many characteristics, special attention must be given to education. In this century we have seen a steady convergence in the income-producing characteristics of black and white females. This is documented in Table 4 which lists years of schooling completed by years of labor market entry from 1930 to 1970. In 1930 the average black new labor force entrant had credentials quite different than her white competitor. The typical black female began her work career with 2.6 fewer years of formal schooling. Almost 60 percent of these

Table 4

YEARS OF SCHOOL COMPLETED AT ESTIMATED TIME OF LABOR MARKET ENTRY

	Year of Labor Market Entry				
	females				
	1930	1940	1950	1960	1970
Mean Schooling of Blacks	8.0	10.1	11.2	11.1	11.4
Mean Schooling of Whites	10.6	11.4	11.9	12.6	12.6
Proportion of Blacks with Less Than 9 Years of School	0.58	0.27	0.15	0.15	0. 11
Proportion of Whites with Less Than 9 Years of School	0.29	0.15	0.09	0.10	0.07

had a grade school diploma or less and only three percent had any post-secondary schooling. As successive cohorts entered the labor force over the last forty years, the competitive disadvantage of blacks has continuously narrowed. By 1970, 0.4 years of schooling separated black and white females at the time of their initial labor force experience. Furthermore, only 4 percent of these new black workers had less than 9 years of schooling and almost a fifth of them had some post-secondary education. There is no question that in terms of measurable nominal characteristics associated with earnings, black and white females are becoming increasingly alike. It should not be surprising that they also appear increasingly similar in monetary rewards offered by the market.

The story conveyed by nominal years of schooling is reinforced by data on schooling quality. Finis Welch (1974) has collected data that tell a clear story of improving relative quality of black schools.[9]

Welch reports that in 1920 black youths attended school only 2/3 as many days as white students, but there were no real black-white differences in days attended by 1954. Similarly, in 1920 teachers of black students had 1-3/4 as many pupils as the average teacher in the country. By 1954 this difference had been substantially reduced. Welch reports similar convergence in other attributes of schools including teachers' salaries, expenditures per student and student retention rates. It is difficult to link attributes of schools to measures of school achievement. Indeed, some of the measures offered by Welch may have had little impact on achievement, but the consistent picture of simultaneous convergence in all these dimensions makes the case for improving quality of black schools plausible.

The 1960 and 1970 Census enables one to test for a number of important black-white differences in the income benefits women receive from education. These include black-white differences in the returns to schooling, the presence of structural shifts in these returns over the decade, the marginal benefits from schooling at different schooling levels, and regional differences that may reflect regional variation in quality of schooling or in the market for skilled labor. In the remainder of this section, the results of these comparisons from the Census regressions are summarized.

The education coefficients for each race-year are listed in Table 5. In both Census years the income benefits from schooling are significantly higher for black women. Table 5 also indicates a statistically significant rise in schooling coefficients over the decade. The difference in this secular increase by race is always small. In the constrained estimates, it is slightly higher among blacks for those over forty and larger for white women in the less than 30 group. Finally, the separate

Table 5

ESTIMATED EDUCATION COEFFICIENTS

Age	1970 Whites	1960 Whites	1970 Blacks	1960 Blacks
A. Unconstrained Estimates				
21-25	.057	.047	.068	.064
26-30	.052	.045	.071	.067
31-35	.054	.038	.071	.059
36-40	.055	.038	.073	.060
41-50	.051	.042	.070	.059
51-60	.051	.050	.067	.064
21-60	.053	.045	.070	.0621
B. Constrained Estimates				
21-30	.069	.049	.071	.058
31-40	.061	.041	.071	.054
41-60	.060	.045	.069	.051

estimates within age categories reveal no systematic cross-sectional life cycle pattern in the returns to schooling.

A more detailed examination of the wage-schooling relationship produced patterns suppressed in this simple specification. For example, when separate education coefficients were estimated for the three segments of the schooling spline, significant nonlinearities in the returns to female schooling were found (see Table 6). For both races, coefficients rise rapidly with schooling level with only marginal benefits from schooling below the college level. Wages typically increase by less than one percent per year of elementary schooling and by less than five percent in the high school segment. No significant racial difference in education coefficients exists below the college level. But the premia to college are approximately 15 percent for blacks and 10 percent for whites.[10] In contrast to results generally obtained for men, most of the

Table 6

SPLINED EDUCATION COEFFICIENTS

	1960 Blacks			1960 Whites		
	0-8	9-12	13+	0-8	9-12	13+
Age						
21-30	.0347	.0277	.1329	-.0029*	.0469	.0507
31-40	.0178	.0360	.1346	-.0003*	.0189	.0812
41-60	.0142	.0397	.1606	-.0017*	.0272	.1129
21-60	.0175	.0368	.1449	-.0022*	.0293	.0908
	1970 Blacks			1970 Whites		
	0-8	9-12	13+	0-8	9-12	13+
21-30	.0018*	.0502	.1129	-.009*	.0571	.0795
31-40	-.0029*	.0575	.1539	-.0048*	.0404	.1163
41-60	.0060*	.0370	.1644	-.0034*	.0346	.1176
21-60	.0020*	.0470	.1478	-.0051*	.0401	.1061

*indicates coefficient not significantly different from zero.

income benefits from schooling for women result from college attendance.[11]

Because of the importance of the South in black-white comparisons, the schooling variables were interacted with residence and birth in the South. The purpose of this dual interaction with region of residence and birth was to distinguish between two distinct hypotheses -- schooling quality and the market for skilled labor. Since skilled labor is relatively scarce in the South, the premium to skill (education) may be higher there, even though Southern schools are of lower quality. These two effects may be separated by interacting years of schooling with dummy variables for Southern residence and Southern birth -- the former to capture regional differences in the return to skill and the latter to measure regional differences in the quality of schools.

For black women in 1960 and 1970, the returns to elementary and high

school were significantly lower for those born in the South, supporting the notion that the Southern schools attended by these women were of lower quality. (See Table 7). However, the interaction of Southern birth with college education was insignificant. This was expected, since place of birth is a much poorer proxy for location of college attendance. The Southern residence interaction indicates that the market

Table 7

REGIONAL SCHOOLING COEFFICIENTS

Years of Schooling	1960 Whites	1960 Blacks	1970 Whites	1970 Blacks
0-12	.0193	.0172	.0178	.0221
13+	.0913	.0924	.1296	.1187
0-12*Southern Birth	-.0017	.0097*	-.0134	.0221
13+*Southern Birth	.0079*	-.0014*	.0031*	-.0277
0-12*Southern Residence	.0135	.0054*	.0203	.0066*
13+*Southern Residence	.0901	.0020*	.0368	-.0189

for college-trained black women is significantly better in the South. The wage premium received from college ranges from 7 to 11 percent higher in the South in 1960 than in the rest of the country. One plausible rationale for this regional difference is that the market for skilled labor is national in scope so that wages of skilled labor are equated across regional labor markets. The less mobile unskilled worker is more constrained by local labor markets so that wages for the relatively abundant unskilled black female workers in the South may be low relative to other regions.[12] For white women, the differences between regions are much smaller. In 1960 there were no significant regional interactions in the white schooling coefficients. The 1970 white sample may indicate that schooling quality at the elementary and high school levels may be higher in the South for

white women, but the lack of confirmation of this result in the 1960 white data makes one skeptical about its general validity.

Regional Variables

After controlling for education, age, and degree of government employment, large wage differentials among regions were estimated. Identifying the reasons for these wage differentials is a complex empirical problem that lies outside the scope of this paper. They partly reflect cost of living differences between regions or compensatory payment for the relative attractiveness of locational attributes such as climate, crime and density. Given the magnitude of some of the differentials, they most likely proxy otherwise unmeasured indices of skill. In lieu of decomposing these regional wage differentials into their component parts, my less ambitious goal is to measure how much of the change in black-white wages over time can be attributed to the different regional structure of wages and population densities by race. As wages between regions change over time, whatever their underlying cause, it is possible to measure its impact on the aggregate black-white wage ratio.[13]

The salient migratory event is, of course, the large exodus of blacks from the South. In 1900 almost ninety percent of blacks were located in the South. In a process beginning in 1910 and accelerating after the Second World War, blacks have left the South and relocated in the urban North. By 1970 the proportion of blacks in the South declined to approximately one-half. An equally striking development is the increasing urbanization of the black South. While practically all Northern blacks are in urban areas, blacks traditionally resided in the rural sections of the South. In 1900 less than 20 percent of black Southerners lived in urban areas,

while by 1970 the proportion had risen to almost 70 percent. The Southern-rural to urban-North migration of blacks has partly been superseded recently by Southern blacks moving to economically growing Southern cities.

Table 8 lists regional wage differentials estimated in the constrained regression. The unconstrained regressions reject any significant race differences in wages in areas outside the South either in 1960 or 1970.[14] Female wages in the non-Southern regions fell over the decade relative to the omitted base class (the Northeast), but this decline was neutral across race. In contrast, important race differences exist in the South and significant trends occurred between 1960 and 1970. Although all women received lower wages in the South, blacks in 1970 earned 12 to 30 percent lower wages than whites. It is traditional in analyzing black-white wage differentials to rely on such broad distinctions between regions as North and South, but the South may well be the least homogenous region of the country. Within the South, black East-South Central residents receive wages 10-12 percent lower than those in the rest of the South.

Black female wages have risen significantly relative to whites' in both Southern subregions, but this convergence occurred almost exclusively among new labor market entrants. Black-white female wage ratios in the South increased by 10 percent more than in the rest of the country for women under thirty and rose by 3 percent more for older workers. Vintage effects, improving relative quality of new cohorts of black workers are apparently larger in the South. These new cohorts of Southern black female workers will enjoy career prospects that differ significantly from those which confronted their predecessors.[15]

Table 8

ESTIMATED REGIONAL WAGE COEFFICIENTS

	1970 Whites	1970 Blacks	1960 Whites	1960 Blacks
A. Non-South				
E.No.Central	-.0412	-.0412	-.0192	-.0192
W.No.Central & Mountain	-.1456	-.1456	-.1112	-.1112
Pacific	-.0251	-.0637	.0360	-.0026
Metropolitan Resident	.0922	.0922	.1133	.0907
Central City Resident	.0541	.0179	.0541	.1091
B. South				
1. So.Atlantic & W.So.Central				
Ages 21-30	-.0869	-.2153	-.0869	-.3238
Ages 31-60	-.0784	-.3112	-.0784	-.3316
2. E.So.Central				
Ages 21-30	-.0701	-.3244	-.1136	-.4236
Ages 31-60	-.1136	-.3935	-.1136	-.4509
3. Metropolitan Resident	.0718	-.0331	.0718	.0331
3. Central City Resident	.0004	.1259	.0670	.1368

Government Variables

Many cross-sectional studies have assigned a major part of the improvement in the relative economic status of blacks to the effects of government anti-discriminatory legislation. Unfortunately, the standard empirical practice was to deduce the impact of government as a component of the residual--all changes not accounted for by other explanatory variables. Since these residuals measure ignorance, and could proxy any neglected factor, more direct tests are required before any confidence

can be placed in this conclusion. I have included variables measuring wage premia paid in industries that would seem most susceptible to pressures from government. The most direct is, of course, employment in the government itself. The second level measures employment in industries regulated by either the federal or state and local governments. The final set of variables indicates the fraction of an industry's sales that go to either the federal or state and local government.[16]

Table 9 lists the proportion of women in direct government employment. The public sector is becoming a more important employer for all females, but this tendency is more prominent among black women where direct government employment increased from .18 to .28. The expanded entry into government is approximately the same by race in the younger age groups (those less than 35), but the increases are even larger for older black women while only marginal changes are present among whites. For indirect government employment, a similar pattern of increased black participation exists. Although these industries do not represent a significant fraction of female employment, the proportion of blacks employed in each category has risen sharply both absolutely and relative to whites.

Estimated female wage differences between the government and non-government sectors are large. For direct government employment, white women in 1970 received 15 to 20 percent higher wages when employed by the government. Where white women do well, blacks tend to do even better with wage premia approximately 10 percent higher than that observed among whites. Wage premia are paid to women in indirect government employment, as well. However, the advantage of government employment of blacks (relative to whites) fell over the decade by 10 to 15 percent. Therefore, although

Table 9

WAGES AND EMPLOYMENT IN GOVERNMENT

A. Direct Government Employment

	21-25	26-30	31-35	36-40	41-50	51-60	21-60
1960 Whites	.229	.205	.189	.202	.226	.226	.212
1960 Whites	.164	.134	.132	.190	.190	.218	.175
1970 Blacks	.242	.296	.292	.296	.296	.238	.280
1970 Whites	.172	.200	.218	.170	.170	.146	.180

B. Wage Differentials for Government (Direct and Indirect)

	Direct Gov't. Ages 21-30	Direct Gov't. Ages 31-60	Reg. State and Local
1970 Whites	.1510	.2029	.1025
1970 Blacks	.2433	.3262	.1025
1960 Whites	.1510	.2501	.1957
1960 Blacks	.3361	.4953	.1957

	Reg. Federal	State and Local Share	Federal Share
1970 Whites	.2213	.0030	.0051
1970 Blacks	.1237	.0071	.0051
1960 Whites	.2213	.0077	.0051
1960 Blacks	.3556	.0118	.0067

significant inroads were made by black women into government employment where wages are high, the wage advantage for black women fell significantly over the decade. The net impact of these conflicting trends on the economic status of black women is discussed in the section below summarizing the regression accounting.

Part-Time Work

Another dimension of the fundamental change taking place in the labor market for black women involves their shift from part-time employment. The distribution of usual hours worked listed in Table 10 shows a significant transfer of black women from part-time employment as the

Table 10

DISTRIBUTION OF HOURS WORKED

Hours Worked	Age 21-30	31-40	41-60	21-60
1-29				
Whites 1970	.191	.284	.209	.222
Whites 1960	.158	.226	.200	.199
Blacks 1970	.131	.156	.213	.174
Blacks 1960	.228	.253	.317	.276
30-39				
Whites 1970	.216	.199	.224	.216
Whites 1960	.188	.172	.209	.194
Blacks 1970	.209	.202	.207	.206
Blacks 1960	.179	.185	.169	.176
40				
Whites 1970	.488	.422	.464	.460
Whites 1960	.520	.463	.449	.467
Blacks 1970	.578	.563	.504	.542
Blacks 1960	.432	.425	.362	.399
41+				
Whites 1970	.105	.095	.103	.102
Whites 1960	.137	.138	.142	.140
Blacks 1970	.083	.080	.076	.078
Blacks 1960	.161	.137	.152	.149

percentage of blacks working less than 30 hours declined from .27 to .17. Blacks in 1960 were more likely to have part-time jobs than white women, but this reversed over the decade suggesting that new white female market participants have selected part-time work. Another dimension of this change is the increasing concentration of blacks at the conventional 40-hour work week.

Blacks can gain in three ways from a shift into full-time jobs. Most directly, their observed weekly and annual earnings are higher as

a result of the increased work effort. Part-time jobs also tend to be transitory over time, so that full-time work may signal a more permanent commitment to the labor force. Finally, if full-time employees receive higher wage rates, observed mean black wages will rise as they shift into full-time work. The problem in assigning part of the recent wage increase to this factor is indicated by the estimated wage differential for those who worked more than 30 hours per week. In 1970 white women working more than 30 hours earned 8 percent higher hourly wages, but 1970 black women earned 8 percent less for full-time work. Over the decade, the estimated wage differential increased by about 10 percent, but this rise was neutral over race. Therefore, the shift into full-time jobs predicts a fall in black-white hourly wages.

Because of the absence of direct information on hourly wages in the Census, it is not ideal data to use for estimating breakpoints in the wage-hours locus.[17] More appropriate data will ultimately determine the importance of the adoption of full-time employment in raising black female wages. There is, of course, no *a priori* reason why blacks and whites must face the same wage-hours tradeoffs.[18] The combined wage-hours package offered by firms is determined by many factors in addition to labor-leisure schedules. It is intrinsically tied to the nature of an occupation so that as blacks shift out of their traditional part-time occupations (which differ from those of whites), the stability of estimated cross-sectional wage-hours budget constraints may be a poor basis for predicting future changes. In any case, of all the factors considered in this study, the part-time/full-time distinction was the least successful in accounting for the recent changes.[19]

Summary of Regression Accounting

In this section, my attempt to account for the changes in the black-white wage ratio between 1960 and 1970 is presented. Using the OLS regression estimates, the change in the wage ratio between 1960 and 1970 may be written as

$$\Delta \ln \bar{R} = [(\bar{X}_{B70} - \bar{X}_{B60}) - (\bar{X}_{W70} - \bar{X}_{W60})]b_o + (\bar{X}_{B70} - \bar{X}_{B60})\delta_1 + (\bar{X}_{W60} - \bar{X}_{B60})'\delta_2 - (\bar{X}_{B60} - \bar{X}_{W70})\delta_{12} - ({}_{12}\bar{X}_{W70})$$

The results of the regression accounting are summarized in Table 11.[20] The main effects measure that part of the growth in black-white ratios due to contraction or expansion over the decade in black-white differences in characteristics (valued at 1970 white parameter values). The next three terms capture the impact of differential payments for the same characteristics. If blacks earn less than whites for any attribute, the ratio of black to white earnings will decline if this attribute increases over time. Similarly, the year effect proxies premia by year. If 1970 was a good year relative to 1960, those individuals with a large amount of these characteristics will gain more from the increased "price." The race-year term is an index of any differential payments blacks received in 1960 relative to 1970 (above the white change between the decade). If such differentials were eliminated over the decade, the black-white wage ratio would fall. The final term is a modified race-year intercept that represents the rise in black-white wages due to changing relative black-white prices evaluated at the 1970 white characteristic vector. It measures the relative black shift in the regression line at the 1970 white mean.[21]

Table 11

SUMMARY OF REGRESSION ACCOUNTING FOR BLACK-WHITE WAGE GROWTH

Observed Increase = 23.60

Variable	Main Effects	Race	Year	Race-Year	Modified Race-Year Intercept	Total
Non-south region	.512	-.065	.995	-1.571	-0.500	-.630
South	.200	.971	-.564	.686	1.830	3.093
Part/time/ full-time work	.976	-1.504	-.697	.000	.000	-1.225
Government	1.615	1.100	.375	.875	-3.900	.065
Age	-.099	.200	-.388	.577	-9.500	-9.210
Education	4.661	.715	-2.344	-.303	-1.400	1.340
Race-year intercept	--	--	--	--	30.200	30.200
Total	7.866	1.417	-2.612	.263	16.736	23.600

As indicated by the main effects column, 1/3 of the rise in the ratio of black-white female hourly wages is explained by converging nominal characteristics. As new cohorts of black workers enter the market, the distinction between races in income-producing attributes is eroding and leading to a narrowing of the wage gap by race. With the exception of age, all the characteristics included in the regression contribute to the rise in relative black female wages. Since larger birth rates make the average age of successive cross-sections of black workers younger (relative to whites), age has a small negative effect on mean black relative wages. Education plays by far the dominant role in the female accounting, explaining 56 percent of the growth

in wages due to increased characteristic congruency. The difference in black-white years of schooling completed declined by 3/4 of a year between 1960 and 1970.[22] The large influx of blacks into direct and indirect government employment is the second leading contributor--accounting for 26 percent of the rise due to characteristic convergence. Migration per se explains less than 10 percent of the rise attributable to more similar attributes. The main migration movements were the increased urbanization of blacks in both the North and South and the migration of blacks from the South to the North.[23] Finally, the movement of black women into full-time jobs explains 12 percent of the relative wage increase due to more similar attributes.

The other terms in Table 1 provide additional insight into the differential structure of wage equations by race and the role of these differences in explaining improvement among blacks. The direct effect of converging schooling levels was partially offset by differential rates of return across years. Since the return to schooling rose over the decade and whites have more schooling than blacks, white women benefitted more from the increased price. In explaining changes in wage ratios, the South dominated regional comparisons. The Southern variables account for a significant part of the rise in female wage ratios. Although migration flows had a small favorable impact on blacks, convergence toward the national norm in black-white Southern wage ratios (the race-year term) is far more important. Thus, the Southern region contribution is mainly the consequence of an altered wage structure within the South rather than migration movements per se.

While the direct effect of increased government employment raised relative wages of black women, black-white female wage ratios have declined in these sectors, indicating that the largest black wage gains were achieved in the private sector. This relative deterioration in black-white female wages in these government sectors lowered the gains attributed to government to a small positive amount. However, the magnitude of the employment inroads made by black women suggests that they are the most likely recipients of any beneficial effects of affirmative action.[24] If quotas are imposed (and enforced) that include both race and sex as criteria, black women have a clear advantage. By filling two quotas for the price of one, they are the cheapest avenue open to employers to adhere to employment quotas. When quotas specify two attributes, one must distinguish between groups which satisfy only one attribute (black men or white women) and those able to meet both criteria simultaneously. Any potential benefits for those with only one targeted chatacteristic will be attenuated by the existence of the dual-attributed population. It is also conceivable that single-attribute minorities could suffer absolutely as firms compensate for the additional hires of black women.

A major component of the regression accounting resides in the modified race-year intercept--a measure of the upwards drift in the relative black regression evaluated at mean 1970 white characteristics. This term measures the change in relative black-white wage ratios, assuming that 1960 black women had possessed and maintained the 1970 white female characteristics, but that the relative black price advantage attached to these characteristics has changed over the decade. It is this shift combined with converging characteristics

that explains the bulk of the rise in relative black female wage. This shift is the predictable consequence of any secular improvement in the relative quality of black women not captured by nominal characteristics included in the earnings functions. While this improvement at the front end of the labor market is open to many interpretations, relative vintage effects for blacks obviously deserve high priority. If successive cohorts of black women have more marketable skills compared to white women, successive cross-sectional wage regressions will show intercept terms in black female wage equations rising more rapidly than those in white female wage functions. And this is clearly what the CPS data show. Finally, the age term indicates that cross-sectional black wage profiles have become flatter relative to whites. This may suggest that vintage effects (the improving quality of more recent cohorts) may be accelerating over time.

Changes in Occupational Distribution of Women

A comparison of occupational distributions provides insights into the female labor market not available from regression analysis. Appendix Table C lists the proportions of black and white married women in 11 occupational categories. Compared to men, women are concentrated in a few broadly defined occupations with the important racial distinction involving the domestic worker category. In 1960, over 1/3 of all black working married women were domestic servants compared to only 2 percent of white women. More than 25 percent of 21-25 year-old black women were domestics in 1960 so that it was an important source of employment even for new entrants. Over the decade, the fraction of black women in domestic service declined to 14 percent with less than 3 percent of the

youngest black women employed there. Moreover, if these distributions are tracked within age cohorts, the contraction in domestic service is not limited only to new entrants. Table 12 lists black-white occupational distributions for major occupational groupings separately for the South and Non-South. While the decline in domestic service exists in both regions, the reduction in the South was more acute. Half of all employed Southern black women were domestic servants in 1960, but this proportion fell to less than a quarter by 1970. Particularly noteworthy are the trends observed among younger workers where the proportion declined from fifty to five percent.[25] Within-cohort tracking also demonstrates that older black Southern women were leaving domestic service for other careers.

The declining proportion of black women in domestic service was not distributed evenly over the other occupational categories. Over half of the decline in domestic service was offset by expanded black employment as clericals and secretaries or typists. This was particularly true among younger black women where the proportion of black women in these jobs increased by almost 20 percentage points. In the older age categories, the service and operative categories increased by as much as the clerical.

With each of the major occupational categories relative black-white female wages rose over the decade,[26] with the largest increases in the two lowest-skilled occupations--service and domestic workers. The improvement in relative black wages is approximately equally the result

TABLE 12

BLACK MARRIED FEMALE OCCUPATIONAL DISTRIBUTIONS, BY AGE

Non-South

	21-25	26-30	31-40	41-50	51-60	21-60
1. Clerical						
Black 1970	.532	.402	.284	.211	.148	.297
Black 1960	.333	.191	.160	.103	.082	.161
2. Operatives						
Black 1970	.165	.148	.183	.185	.160	.173
Black 1960	.233	.269	.224	.208	.140	.216
3. Services						
Black 1970	.123	.179	.253	.289	.318	.244
Black 1960	.227	.218	.225	.276	.228	.240
4. Domestic						
Black 1970	.012	.026	.032	.085	.184	.064
Black 1960	.071	.133	.172	.234	.380	.202

South

	21-25	26-30	31-40	41-50	51-60	21-60
1. Clerical						
Black 1970	.247	.141	.086	.058	.029	.096
Black 1960	.031	.049	.040	.018	.011	.029
2. Operatives						
Black 1970	.282	.260	.215	.155	.095	.192
Black 1960	.127	.110	.111	.096	.060	.100
3. Services						
Black 1970	.197	.234	.280	.304	.277	.269
Black 1960	.251	.256	.213	.207	.194	.217
4. Domestic						
Black 1970	.057	.102	.175	.277	.425	.222
Black 1960	.459	.379	.444	.522	.581	.483

of a rise in relative black wages within these major occupation divisions and the effect of the substantially altered occupational distributions of blacks.[27] To illustrate, the ratio of black-white female wages rose over the decade from .687 to .876. If black and white women in 1970 were distributed across occupations in the same way as they were in 1960, the relative wage would have risen to .772. The decline in the domestic worker category was, of course, the primary factor in the shifting occupational distribution.

The reasons for this sharp decline in domestic service have not been investigated in this research. Given the magnitude of these changes and the historical importance of this occupation for blacks, this decline may have played an important independent role in explaining recent wage changes for blacks. One possibility is that non-pecuniary and non-reported wages are a larger part of total compensation for domestics, so that the extent or the real wage improvement among black women using reported wages could be overstated. An indepth study of the market for domestic servants with a careful specification of both the demand and supply sides of this market is clearly required before any clear understanding of the reasons for using wages for black women can be achieved. It does seem unlikely that changes of the magnitude observed could be induced primarily by demand-side factors. More likely, opportunities are improving and expanding in other sectors so rapidly that black women are being pulled into other occupations. The rise in the relative wage of black women in domestic service is consistent with this supply-side view.

Sample Composition and Censoring

Less than half of all married women work in any given week. Since we can directly observe wages only for working women, the time series behavior of female wage rates may be caused in part by sample composition as the extent of market participation increases or the rules for sample eligibility are altered. As the proportion of women in the labor force increases over time, changes in black-white wage ratios among market participants may differ from trends in this wage ratio computed for all women. Because the decision to work is determined by both observed and unmeasurable characteristics of women, sample composition of the work force is important for two distinct reasons. First, changes in measurable characteristics of workers may diverge from changes in the same characteristics among all women. For example, the composition of new labor force entrants among blacks may be heavily weighted towards the more educated, while most of the new white workers are those with relatively little education. In this case, the average black-white wage ratio of workers will increase by more than this wage ratio for all women. A second reason relates to the problem of censoring bias in wage equations. Because we cannot account for all factors relevant to the decision to work, wages of working women and non-working women may differ even among women with the same measured attributes. As labor force participation rates increase, the difference between the mean wage offer to workers and to all women will decline.

A number of statistical techniques have been advanced to deal with such censoring problems. The most straightforward approach is that suggested by Heckman.[28] Consider the following system:

$$w_m = \alpha X + \mu_1$$

$$w_R = BY + \mu_2$$

where w_m and w_R are a woman's market wage and reservation wage, respectively.

Letting $_p$ represent the participation error, a woman works if

$$\frac{\alpha X - BY}{\sigma_p} > \frac{\mu_p}{\mu_p} \text{ or } I > \frac{\mu_p}{\sigma_p}$$

where I (the participation index) is a standardized normal variable measuring the probability of participation.

The expected wage for working women is

$$E(w_m | I \cdot \sigma_p > \sigma_p) = \alpha X + E(\mu_1 | I \cdot \sigma_p > \mu_p)$$

Clearly, if one estimates the wage equation using samples of working women, biases result because the same set of variables that determine wages serve also as a criterion for sample eligibility. Using standard properties of truncated normal distributions, Heckman has demonstrated that this problem can be viewed as one of specification bias since

$$E(w_m | I \cdot \sigma_p > \mu_p) = \alpha X + \frac{\sigma_1^2 - \sigma_{12}}{\sigma_p} \lambda = \alpha X + \frac{\sigma_{1p}}{\sigma_p}$$

where λ is

$$\frac{\frac{1}{2\pi} e^{-1/2t^2}}{\int_{-\infty}^{I} \frac{1}{2} e^{-1/2t^2} dt}$$

λ (Mill's ratio) is the ratio of the height of the density of the standardized normal distribution to the cumulative area to that point (the probability of participating). Thus a simple correction for bias involves including λ among the regressors.

The auxiliary regression between λ and x has a straightforward interpretation. Since λ is inversely related to the probability of market participation, variables that increase market participation will have a negative coefficient in the auxiliary regression. This "selectivity" bias would distort measured average wage differences among groups that differ in their labor force participation rates. The argument can be illustrated by assuming that the wage function is the same for all women except for a race shift term. Then the expected wage of working women is

$$E(w_m) = \alpha + BX + \delta_1 \text{ Race } (=1 \text{ if white}) + \gamma\lambda$$

where γ is the coefficient on λ and δ_1 is the white-black (positive) wage differential. Since white women have lower participation rates than black women, the dummy variable for race and λ will be positively correlated. If λ is positive, the observed wage differential between white and black women (δ_1 for working women only) will be larger than the true wage differential ($\hat{\delta}_1$ adjusted for censoring). Censoring has implications as well for the rate of convergence in wage rates over time. If participation rates for white women increase more rapidly than those of black women, observed black-white wage differentials of working women will converge more rapidly than the true racial wage differentials for all women. Therefore, one potential cause for the rise in the black-white female wage differential could be due to these censoring considerations.

Because of differential increases in market participation within education and age groups, changes in the composition of the sample of workers between 1960 and 1970 did contribute to the measured rise in

relative black female wages. Compared to whites, increases in labor market participation rates for black women were larger among the more educated and the young. According to Table 13, the difference in average education between working black and white women declined by 3/4 of a year over the decade. However, for non-workers, the difference in average schooling decreased by only .4 of a year. This pattern is most pronounced among older women. For women over forty years old, the difference in years of schooling between white female workers and non-workers actually declined slightly between 1960 and 1970. This indicates that a significant fraction of the additional market entrants in the post-childbearing part of the life cycle were from the lower section of the white education distribution. The more rapid increases in participation rates among younger blacks also (see Table 3) produced changes in the sample composition. In the sample of workers, black women were younger relative to whites in 1970 than in 1960. However, in the group of non-workers black women were older relative to whites in 1970.

The wage functions from the Census provide a simple method of evaluating the effect of differential change in measured characteristics of workers and non-workers. The direct effect of converging characteristics in equation (1) above is evaluated at 1970 white female parameter values.[29] Using the mean characteristic vector for the working, non-working and full sample, predicted average wages can be computed for each group. According to Table 13,[30] the predicted rise in relative black wages for workers due to characteristic convergence is 5.97 percent. For non-workers, the predicted increase is only 3.89. Most of the difference between these two groups is caused by

Table 13

A. Education Levels by Work Status

Ages	Workers	Non-Workers	Full Sample	Workers	Non-Workers	Full Sample
		1970 Whites			1970 Blacks	
21-30	12.73	11.87	12.14	11.95	10.88	11.32
31-40	11.87	11.57	11.67	11.37	10.13	10.71
41-60	11.43	10.78	11.02	10.11	8.58	9.26
21-60	11.86	11.30	11.50	10.98	9.69	10.26
		1960 Whites			1960 Blacks	
21-30	11.94	11.26	11.40	10.69	9.91	10.11
31-40	10.81	11.08	11.12	10.01	9.00	9.36
41-60	10.81	9.80	10.09	8.59	7.17	7.68
21-60	11.16	10.58	10.73	9.54	8.57	8.81

B. Change in Black-White Difference in Average Education and Age, Between 1960 and 1970

	Workers	Non Workers	Full Sample
Education	.752	.400	.607
Age	-.086	.298	.080

C. Predicted Rise in Black-White Female Relative Wages Due to Converging Characteristics

Variable	Workers	Non-Workers	Full Sample
Education	5.315	2.483	4.162
Non-South Region	.589	.760	.597
South Region	.004	.274	.146
Age	-.114	.295	.093
TOTAL	5.794	3.811	4.997

the education variable. For non-workers, the predicted rise in relative black wages attributed to more similar education levels is less than half as large as that for the sample of workers. Changes in sample composition of these measurable attributes apparently did play a role, but not a major one, in explaining the rise in black female wages.

Correcting for censored samples in the Census is difficult because of the lack of direct information on market experience. The exclusion of experience from the wage equation not only produces biases in other coefficients through conventional specification error, but it is doubly important because of its close relation to the censoring correction. In a recent paper, Heckman and Willis (1977) have shown that there exists strong positive serial correlation in participation probabilities over time. Since the censoring correction is derived from an equation predicting market participation, the true effects of censoring and market experience can easily be confounded.[31]

Because of these considerations, I used the National Longitudinal Surveys for Mature Women (Parnes data) to measure the potential importance of censoring bias in explaining the rise in black female wages. Because experience is an endogenous variable, an instrument for market experience[32] was obtained. This imputation involved two stages. First, I estimated for the complete sample of married, spouse-present women an auxiliary regression predicting market experience.[33] Because of the truncation of experience at zero, the maximum likelihood tobit procedure was used.[34] The imputed experience was used in the probit estimation of participation probabilities to obtain an estimate of λ.[35] Because the wage function is estimated over a sample of working women, a

second stage of predicting experience over the Parnes working women's sample was necessary. The aim here was to approximate as closely as possible the expected value of experience in the sample of workers.[36]

The final stage wage equations which include predicted experience and the instrumental variable for λ from the probit as regressors are listed in Table 14. For our purposes, the most important coefficient is that for the censoring correction.

The sign of the censoring correction (λ) is indeterminate *a priori*. It may be written

$$\sigma_1^2 (1 - bwR.wm)$$

Table 14

PARNES WAGE EQUATIONS CORRECTED FOR CENSORING

(t-statistics are in parentheses below coefficients)

Variables	Whites			Blacks		
Education of Wife	.0769 (9.40)	.0769 (1.16)	.0811 (9.35)	.1188 (11.19)	.1203 (11.12)	.1041 (7.91)
Southern Residence	-.0522 (1.23)	-.0522 (1.20)	-.0488 (1.13)	-.3726 (5.44)	-.3793 (5.45)	-.3976 (5.71)
Actual Experience	.0185 (2.85)			.0179 (3.99)		
Predicted Experience		.0186 (2.85)	.0245 (3.39)		.0266 (2.95)	.0153 (1.46)
λ			.1961 (1.87)			-.4938 (2.13)
Intercept	-.5415 (5.18)	-.5425 (4.14)	-.8337 (4.10)	-.9932 (6.94)	-1.1195 (6.10)	-.4486 (1.23)
Mean Experience		8.05			10.74	

where bwR.wm is the coefficient obtained in a regression of the residuals in the reservation wage equation on the residuals of the market equation. The coefficient of λ will be negative only if a $1. increase in market wage offers (conditional on x and y) leads to more than a $1. increase in the reservation wage.

The positive coefficient for white women indicates that working white women receive approximately 21 percent higher wages than non-working whites with similar characteristics. However, the large negative coefficient for blacks implies that the average black worker receives approximately 38 percent lower wages than the average non-working woman.[37] If these corrections for censoring are correct, then increases in participation rates would clearly raise the average wage of black working women relative to white working women. Censoring bias appears to be a non-trivial cause of the improvement in relative black female wages.

However, this result must be interpreted with caution. The magnitude of the censoring bias correction for blacks alone creates some concern that the censoring correction may be proxying something else. One possibility is that since the censoring variable is highly correlated (negatively) with participation, this variable may be a better proxy for market experience among blacks than the experience variable used. A second possibility has been suggested recently by James Heckman (1977). The censoring bias correction (and the comparison of market and non-market alternatives) is only strictly valid in a one-period model. In a life cycle context, where current wages are highly correlated with future expected wages, the censoring result could have a different interpretation. For women with continuous

work histories (i.e., blacks) high future wages (since they carry wealth as well as substitution effects) could reduce current-period participation. We would then observe women with highest current wages as non-workers. These considerations and the preliminary nature of the work on censoring must make us cautious in our confidence in the validity of this result.

Conclusion

In this paper, I have attempted to uncover some potential reasons for the remarkable rise in the relative economic status of black women. The increased similarity in education distributions between races and the rapid rise in black wages in the South were important reasons for the wage advances of black women. While my evidence on affirmative action is mixed, the primary beneficiary of these programs may well have been black women. Theoretical considerations alongside the large expansion of black female employment in those industries most vulnerable to affirmative action pressures provide at least circumstantial evidence that the wages of black women may have been increased by these programs. While not fully explored in this study, the adoption of full-time jobs by blacks and the elimination of domestic service as their primary occupation are also important candidates for explaining part of the rise in black female wages. Sample composition and censoring appear to account also for part of the improvement. The increases in labor force participation rates over the decade are more heavily weighted towards those black women who, in terms of measurable characteristics (such as education), would normally receive higher wages. Moreover, corrections for sample censoring suggest that in terms of

unobservable characteristics, black women with the highest potential market wages are non-participants in the labor market. As participation rates increase over time, this will produce a recorded rise in the average wage of black women relative to white women in the sample of workers. My evidence also rejects the secondary labor market view that black females are relegated to dead-end jobs with little career growth potential. In fact, within cohorts, wages of black women have risen relative to whites over the life cycle. Finally, the between-cohort comparisons indicate the presence of strong relative vintage effects among blacks. More recent cohorts of black women are simply more similar to white women in marketable skills than were their black predecessors. Rising relative levels and quality of schooling are two likely contributors to the improving relative quality of newer cohorts of blacks. In fact, the regression analysis together with the time-series convergence between races in the level and quality of income-producing attributes indicate that, while it is certainly not the sole cause, vintage effects may be the dominant reason for the improved economic position of black women.

APPENDIX

Table A1

Pooled Female Regressions (Unconstrained)

1. EDUCATION

	Age 21-25	Age 26-30	Age 31-35	Age 36-40	Age 41-50	Age 51-60
Main	.0637	.0661	.0589	.0601	.0594	.0635
	16.46	22.54	21.43	24.70	27.99	24.14
Race	.0044	.0061	.0124	.0125	.0102	.0033
	.79	1.46	3.24	3.74	3.45	.87
Year	-.0164	-.0212	-.0207	-.0220	-.0155	-.0140
	-2.60	-4.59	-4.92	(6.00)	-4.83	-3.44
Race-Year	.0046	.0070	.0031	.0041	-.0027	-.0018
	(.51)	1.10	.55	.82	(.62)	(.31)

2. NON-SOUTHERN REGIONAL VARIABLES

	E. No. Central	W. No. Central and Mtn.	Pacific	Met. Non-South	Cen.City Non-So.
Main	-.0378	-.1426	-.0249	.0882	.0574
	-2.67	-8.64	-1.50	6.76	4.24
Race	-.0105	-.0165	-.0512	.0215	-.0433
	-.47	-.49	-1.81	.66	-1.92
Year	.0235	.0528	.0684	.0310	-.0052
	(1.07)	(1.99)	(2.69)	(1.47)	(-.24)
Race-Year	-.0010	-.0514	-.0175	-.0649	.0992
	(-.03)	(-.96)	-.39	(-1.18)	(2.63)

3. SOUTHERN REGIONAL VARIABLES

	Metro. South	Central City South	Metro. So.*Age	So.Atlantic and W.S.Central 21-30	S.Atlan. and W.S.Cen. 31-60	E.S.Central 21-30	E.S.Cen. 31-60
Main	.0610	.0046	.0010	-.0063	-.0758	-.0720	-.1201
	1.86	.19	.72	-3.03	-3.74	-1.78	-4.37
Race	-.1091	.1256	.0017	-.1161	-.2163	-.2392	-.2623
	-2.40	4.15	.94	-2.51	-5.77	-3.84	-5.87
Year	.0351	.0582	-.0025	-.0002	.0048	-.0855	.0262
	.65	1.51	-1.08	-.01	.15	-1.25	.61
Race-Year	.0065	-.0573	.0039	-.1546	-.0591	-.1031	-.1181
	.09	-1.19	1.31	-2.07	-1.00	-1.01	-1.68

4. GOVERNMENT VARIABLES

	Reg.So. and Local	Reg. Fed.	So. and Local Share	Fed. Share	Govt. 21-30	Govt. 31-60
Main	.0862	.2045	.0029	.0053	.1590	.2019
	1.27	7.08	2.24	(9.04)	6.35	13.95
Race	.0627	-.0846	.0043	-.0007	.0832	.1214
	(.47)	-1.65	1.75	.63	2.41	5.90
Year	.1126	.0395	.0048	.0000	-.0004	.0480
	1.02	(.89)	2.30	(.02)	-.01	(2.05)
Race-Year	-.0565	.1961	.0003	.0020	.0062	.1232
	-.23	2.13	.05	(1.10)	(1.55)	(3.62)

5. MISCELLANEOUS

	Usual Hrs. More Than 30	Age 1-10	Age 11-40	Intercept
Main	.0814	.0097	-.0013	-.1313
	7.02	1.62	(.75)	-1.95
Race	-.1592	-.0061	-.0016	.0691
	-8.86	-.74	-.66	(.74)
Year	-.1005	.0053	.0038	-.1618
	-5.43	(.54)	(1.50)	(-1.58)
Race-Year	-.0059	-.0013	.0051	-.2162
	(.22)	-1.01	(1.45)	(-1.44)

APPENDIX

Table A2

Pooled Female Regressions (Constrained)

1. EDUCATION

	Age 21-30	Age 31-40	Age 41-60
Main	..0691	.0611	.0595
	26.96	27.39	28.49
Race	.0021	.0096	.0094
	.57	3.12	3.23
Year	-.0204	-.0202	-.0146
	-5.30	-6.04	-4.64
Race-Year	.0070	.0036	-.0032
	1.25	.78	-.73

2. NON-SOUTHERN REGIONAL VARIABLES

	E.No.Central	W.No.Cen.&Mtn.	Pacific	Metro. Non-So.	Cen. City Non-South
Main	-.0412	-.1456	-.0251	.0922	.0541
	-3.84	-10.51	-1.69	8.18	5.23
Race	-----	-----	-.0486	-----	-.0362
	-----	-----	-2.42	-----	-1.84
Year	.0220	.0384	.0611	.0211	-----
	1.36	1.82	3.01	1.30	-----
Race-Year	-----	-----	-----	-.0226	.0912
	-----	-----	-----	-.54	2.99

3. SOUTHERN REGIONAL VARIABLES

	Metro. So.	Cen.City South	Metro.S. *Age	S.Atl.&W.S. Cen. 21-30	S.Atl.&W.S. Cen. 31-60	E.S.Cen. 21-30	E.S.Cen. 31-60
Main	.0718	.0004	.0007	-.0869	-.0784	-.0701	-.1136
	2.77	.02	.57	-3.99	-5.25	-1.80	-5.46
Race	-.1049	.1255	.0016	-.1284	-.2238	-.2543	-.2799
	-3.05	4.26	1.00	-3.81	-9.20	-4.58	-8.66
Year	-----	.0676	-.0013	-----	-----	-.0891	-----
	-----	1.86	-1.04	-----	-----	-1.41	-----
Race-Year	-----	-.0567	.0041	-.1085	-.0204	-.0556	-.0574
	-----	-1.27	2.40	-2.19	-.49	-.60	-1.20

4. GOVERNMENT VARIABLES

	Reg.So. & Local	Reg.Fed.	So.and Local Share	Fed.Share	Govt. 21-30	Govt. 31-60
Main	.1025	.2213	.0030	.0051	.1510	.2029
	1.77	10.15	2.45	13.18	7.37	14.16
Race	-----	-.0976	.0041	-----	.0923	.1233
	-----	-2.06	2.04	-----	2.97	6.12
Year	.0932	-----	.0047	-----	-----	.0472
	.95	-----	2.68	-----	-----	2.06
Race-Year	-----	.2319	-----	.0016	.0928	.1209
	-----	2.88	-----	1.19	2.20	3.63

5. MISCELLANEOUS

	Usual Hours More Than 30	Age 1-10	Age 11-40	Intercept
Main	.0825	.0138	.0042	-.1907
	7.89	4.12	3.92	-4.43
Race	-.1625	-.0027	-.0056	.1007
	-12.11	-.57	-3.51	1.64
Year	-.1020	-.0035	-.0034	-.0748
	-7.60	-.65	-2.10	-1.12
Race-Year	-----	.0024	.0056	-.3016
	-----	.31	2.33	-3.04

APPENDIX

Table B

Detailed Accounting for Black-White Wage Growth

Variable	Main Effects	Race	Year	Race-Year	Total
E.No.Central	-0.1044	0.0	0.1041	0.0	-0.0002
W.No.Central and Mountain	0.1794	0.0	0.3141	0.0	0.4936
Pacific	-0.0398	-0.0503	0.4280	0.0	0.3379
Southern Metro	-0.1314	-0.0431	0.0	0.0	-0.1745
Northern Metro	0.2745	0.0	0.1490	-0.1535	0.2700
Cen. City South	0.0001	0.1408	-1.0492	0.8342	-0.0741
Cen. City Non-South	0.2025	-0.0148	0.0	-1.4177	-1.2301
Usual Hrs. More Than 30	0.9760	-1.5043	-0.6966	0.0	-1.2249
Regulated by State and Local	0.0036	0.0	0.0297	0.0	0.0333
Regulated by Federal	0.2148	-0.0742	0.0	0.4750	0.6157
So. Metro Residence-Age Interaction	-0.0392	-0.0169	0.4220	-1.1233	-0.7573
State and Local Share	0.0510	0.1237	0.3871	0.0	0.5618
Fed. Share	0.2802	0.0	0.0	0.2272	0.5074
S.Atlantic and W.So. Central 21-30	-0.1284	-0.2882	0.0	0.3159	-0.1008
E.S.Central 21-30	0.0234	-0.0254	0.0630	0.0152	0.0762
S.Atlantic and W.So. Central 31-60	0.3155	0.9019	0.0	0.3879	1.6052
E.S.Central 31-60	0.1599	0.3022	0.0	0.2565	0.7185
Govt. Workers 21-30	0.1059	0.2833	0.0	0.1004	0.4896
Govt. Workers 31-60	.9594	0.7669	-0.0422	0.0722	1.7563
Education 21-30	0.8352	0.1865	-0.2233	0.6126	1.4109
Education 31-40	2.7451	-0.0365	0.3787	-0.2416	2.8458
Education 41-60	1.0812	0.5651	-2.4889	- .6743	-1.5169
Age 1-10	-0.0226	0.0887	0.0288	-0.0952	-0.0002
Age 11-40	-0.0763	0.1116	-0.4164	0.6720	0.2909
TOTAL	7.8658	1.4171	-2.6121	0.2634	6.9341

Appendix

Table C

Female Occupational Distributions by Age

1. Nurses	21-25	26-30	31-40	41-50	51-60	21-60
White 1970	.062	.061	.052	.040	.036	.048
White 1960	.047	.050	.030	.024	.020	.0303
Black 1970	.030	.038	.039	.033	.027	.034
Black 1960	.025	.021	.020	.009	.013	.016
2. Non-College Teachers						
White 1970	.111	.130	.070	.063	.072	.081
White 1960	.080	.059	.044	.072	.102	.069
Black 1970	.051	.094	.092	.069	.062	.076
Black 1960	.032	.069	.062	.057	.059	.058
3. Other Professionals						
White 1970	.051	.065	.043	.048	.040	.046
White 1960	.041	.046	.036	.043	.031	.036
Black 1970	.035	.044	.037	.036	.025	.035
Black 1960	.016	.020	.025	.019	.013	.020
4. Sales Workers						
White 1970	.042	.034	.067	.089	.107	.074
White 1960	.046	.056	.085	.119	.116	.095
Black 1970	.023	.022	.022	.027	.017	.023
Black 1960	.003	.014	.012	.009	.010	.010
5. Clerical						
White 1970	.236	.213	.244	.233	.208	.229
White 1960	.279	.246	.233	.193	.027	.221
Black 1970	.257	.191	.135	.103	.065	.139
Black 1960	.111	.079	.074	.041	.028	.061

Appendix

Table C (cont'd.)

6. Typists and Secretaries	21-25	26-30	31-40	41-50	51-60	21-60
White 1970	.236	.182	.160	.147	.113	.160
White 1960	.235	.165	.118	.090	.074	.118
Black 1970	.139	.085	.053	.031	.015	.057
Black 1960	.068	.036	.031	.014	.011	.027
7. Operatives						
White 1970	.121	.143	.161	.168	.181	.160
White 1960	.138	.218	.231	.221	.195	.210
Black 1970	.221	.203	.202	.170	.123	.183
Black 1960	.179	.184	.164	.145	.091	.152
8. Services						
White 1970	.096	.116	.127	.131	.143	.126
White 1960	.069	.091	.131	.137	.132	.123
Black 1970	.158	.206	.270	.291	.295	.257
Black 1960	.239	.239	.219	.237	.208	.227
9. Craft, Managers, Transport Laborers, and Farm						
White 1970	.041	.048	.066	.071	.085	.066
White 1960	.059	.057	.078	.090	.083	.078
Black 1970	.053	.056	.055	.054	.051	.054
Black 1960	.059	.075	.076	.072	.065	.072
10. Domestics						
White 1970	.003	.008	.009	.011	.016	.010
White 1960	.008	.012	.014	.021	.041	.020
Black 1970	.033	.063	.105	.187	.321	.144
Black 1960	.270	.265	.318	.397	.503	.357

FOOTNOTES

*This research was supported by a grant from NSF. John Cogan and Finis Welch offered many useful comments and suggestions. Jon Duringer and Dan Shapiro provided excellent research assistance.

[1]See Smith-Welch (1977) for an analysis of male wage differentials.

[2]For an examination of white male-female wage differentials, see Fuchs (1974).

[3]Although statements using Table 2 must be qualified because only working female wages are used, a discussion of the patterns is useful in structuring research questions.

[4]Since the work in this paper is confined exclusively to married spouse-present females, the question arises whether any substantial bias results because of this sample restriction. The following table indicates that, although the wage increases are slightly larger among the married spouse-present population, the phenomenon of substantial improvement in black female wages exists across different marital categories.

Black-White Female
Wages, by Marital Status

Year	All Women	Wife of Head	Nonwife of Head
1967	.750	.803	.695
1969	.798	.848	.744
1971	.863	.928	.792
1973	.846	.888	.795
1975	.895	.949	.837

[5]The reversal in the ranking of annual hours worked by race during the decade is reflected in the ranking of the ratios of hourly, weekly, and yearly earnings ratios. In 1960, the black-white ratio was highest for hourly wages and lowest for yearly earnings because of greater hours working among white women. By 1970, this ranking had changed with the largest black-white ratios occurring when annual earnings are used.

[6]The following table describes the conversion between normal and survey week hours obtained in the Parnes. I also attempted predicting normal hours with other variables in addition to the survey week interval. These variables did not add any additional explanatory power.

Relation Between Normal and Survey/Weeks Hours

	Whites		Blacks	
Survey Week Interval	Mean Normal Weekly Hours	Mean Survey Weekly Hours	Mean Normal Weekly Hours	Mean Survey Weekly Hours
1-14	14.84	7.79	16.35	9.69
15-29	23.76	21.25	26.53	21.06
30-34	35.22	31.55	34.03	32.22
35-39	36.16	36.59	36.08	26.22
40	39.82	40.00	39.91	40.00
41-48	41.43	44.90	41.79	44.53
49-59	46.17	51.67	46.44	51.31
60+	49.89	62.56	47.50	71.75

[7]The five regions are East North Central, West North Central and Mountain Pacific, East South Central, Atlantic and West South Central. The omitted (base) class is the Northeast (the combined New England and Middle Atlantic subregions).

[8]By imposing parameter equality either between races or across years or both, estimation efficiency is gained. The potential loss is the bias entailed by incorrect constraints.

[9]For a detailed examination of this data, see Welch (1974).

[10]This nonlinearity suggests that log linear relations between wages and schooling for women must be treated with care. The estimated average return over all schooling levels will be sensitive to the education distribution within the sample.

[11]One could think of selection processes among women which would generate this observed pattern. Women who select themselves into college may well have tastes and abilities suited for market work.

[12]Note that the regional difference in the black college coefficients is much smaller in 1970. Table 7 also indicates that the returns to college schooling rose over the decade in the Non-South, but fell in the South.

[13]Another caveat must be mentioned in interpreting trends in regional wage differentials. In addition to differential growth in real income across regions, these ratios may be altered substantially by migration patterns. These characteristics of migrants relative to those at place of origin and destination can create the illusion of differential trends among regions.

[14]One exception is central city residence where blacks in 1960 earned a four percent premium relative to whites. This reversed over the decade so that by 1970 black women received a four percent smaller wage differential than whites living in central cities. Presumably, the large migration of low-skill blacks into central cities over the decade accounts for this deterioration in mean black wages. Also, wages of blacks are four percent below white females in the West.

[15]Wage differentials for whites remained relatively stable for whites over this period.

[16]This method of testing for affirmative action effects using Census data was first employed in "Black-White Male Wage Ratios: 1960-1970," by James P. Smith and Finis Welch, *American Economic Review*, June 1977.

[17]Even the corrected hours data I estimated in this study contain considerable measurement error. Since hourly wages are computed indirectly using weekly hours, calculating the differential wage payment by type of employment is difficult.

[18]For example, employers may have demands for transitory labor at hours that diverge from the conventional standard work. The requirement for diversity may require a wage premium with fixed costs of work.

[19]It is my feeling that the adoption of full-time jobs by blacks is more important than I have as yet been able to document. It seems desirable to estimate possible non-linearities in the wage-hours budget constraint using data sets like the Parnes which report hourly wage rates directly.

[20]A detailed listing of the regression accounting is contained in Table B of the Appendix. In this accounting, the constrained regression estimates are used. The accounting with the unconstrained regressions is quite similar to that obtained with the constrained.

[21]Any regression accounting is arbitrary in the sense that the quantity weights to evaluate price changes and the price weights to evaluate quantity changes are arbitrary. I have selected the most natural decomposition using the white 1970 characteristics to evaluate price changes. This decomposition is admittedly less objectionable for male comparisons since it is natural to measure changes vis-a-vis current period white males. But any other decomposition for females seemed less useful than the one I chose.

[22]The following table lists education by age for the four Census samples:

Years of Schooling

Age	1960 Blacks	1960 Whites	1970 Blacks	1970 Whites
21-25	10.14	12.33	11.98	12.85
26-30	10.58	11.66	11.92	12.59
31-35	10.35	11.30	11.44	12.03
36-40	9.69	11.20	11.31	11.73
41-50	8.88	10.97	10.49	11.61
51-60	7.98	10.52	9.44	11.18
21-60	9.54	11.17	10.98	11.86

[23]This black exodus was concentrated in the poorer Southern regions--the East South Central and West South Central areas. The Non-South region effect is dominated by the urbanization of blacks in the North.

[24]In an earlier study conducted jointly with Finis Welch dealing with racial comparisons among males, a similar use of government employment was made to test for affirmative action effects for black men. We reported that our evidence indicated on net that the effects of affirmative action in explaining the rise in black male wages were very small (see Smith-Welch 1977). In fact, because white male wages were rising so rapidly relative to blacks in direct and indirect government employment, the predicted impact of affirmative action was slightly negative. In another paper using Current Population Surveys to cover the more recent period (1967-75), an almost identical conclusion was reached for males. See "Race Differences in Earnings: Survey and New Evidence," by James P. Smith and Finis Welch.

[25]This cohort tracking among women must be qualified because of low labor force particpation rates. The proportion of women in given age cohort who are domestics could decline over the decade because (1) working women leave domestic service in favor of other occupations, or (2) new labor market entrants or re-entrants in the age cohort select with greater frequency occupations other than domestic service. Because the 1970 Census lists occupation in 1965, it is possible to obtain some idea of the relative importance of the two. At the present time, I have not examined this information.

[26]The following table lists relative black-white female wages in these five categories in each Census year:

Relative Black-White Female Wages
Within Occupations

Occupational Category	Year 1960	1970
Teachers	.98	.95
Clerical	1.00	.89
Secretaries/Typists	1.03	.93
Operatives	1.14	1.13
Service	1.26	1.00
Domestics	1.45	1.01

[27]This comparison like almost all such comparisons using occupational decomposition can be extremely misleading since it does not allow for substantial changes within the broad occupational categories. It is meant only to be illustrative.

[28]See "Selectivity Bias as a Specification Error," by James Heckman.

[29]These regressions were not corrected for censoring bias. But there is evidence that censoring bias in white female wage functions is not large (see Heckman) and, in particular, does not alter parameter estimates of other coefficients (except the constant term). Therefore, for the exercise performed in the text, censoring bias should not affect the results very much.

[30]Since the full-time and government variables cannot be observed for non-workers, the equations were re-estimated including only the education, region and age variables only. For these variables, the specification is identical to that used in Appendix Table 1.

[31]Market experience should be negatively correlated with the censoring correction λ. Thus, omitting market experience will bias the coefficient on λ towards negative value.

[32]I wish to thank John Cogan for his incisive comments on the methodology of imputing experience.

[33]This was estimated separately for blacks and whites.

[34]The variables used to predict experience were region, age and education of husband, years of current residence, children born, cumulative number of years with children present less than three years old and 3-6 years old, income of husband, years of labor market exposure (Age-Schooling-6), and an interaction of labor market exposure with education and children born.

[35]The probit equations included wife's education, residence in the South, income of husband, number of children 0-5, number of children born, education of husband, and imputed experience.

[36]Consider the following three-equation system:

(1) $w_m = \alpha X + \gamma Exp + u_1$

(2) $w_R = By + u_2$

(3) $Exp = \delta Z + u_3$

where the market and reservation wage equations are identical to those described above. Equation (3) describes the endogenous experience equation. The condition for a woman participating in the market is:

$$\alpha X + \gamma\delta Z - By > u_2 - (u_1 + \gamma u_3)$$

The expected wage among working women is:

$$E(w_m) = \alpha X + \gamma E\ (Exp\ h > 0) + E(u_1 | h>0)$$

or

$$E(w_m) = \alpha X + \gamma(\delta Z + \frac{\sigma_{3p}}{\sigma_p} + \frac{\sigma_{1p}}{\sigma_p}\lambda$$

The regressors for the imputation of experience for workers included a quadratic in education of wife, income of husband, and λ, and the following variables entered linearly: region of residence, cumulative years with children less than 3 and 3-6, labor market exposure, children born, years in current residence and labor market exposure education.

[37]Note that these comparisons are conditional on the same level of attributes for non-working women and working females. Since non-working women have less education, for example, than workers, non-workers would have a lower predicted wage on the deterministic component of the regression.

BIBLIOGRAPHY

Butler, Richard and James Heckman, "The Impact of the Government on the Labor Market Status of Black Americans," unpublished paper, 1977.

Freeman, Richard, "Changes in the Labor Market of Black Americans, 1948-1972," Brookings Papers, Washington, D.C., 1973, 1, 67-120.

Fuchs, Victor, "Recent Trends and Long-run Prospects for Female Earnings," *American Economic Review*, 64, May 1974, 236-242.

Gronau, Reuben, "Wage Comparisons - A Selectivity Bias," *Journal of Political Economy*, November/December 1974.

Heckman, James, "Selectivity Bias as a Specification Error," in *Female Labor Supply: Theory and Estimation*, James P. Smith, Editor, Princeton University Press, forthcoming.

-----, "Dynamic Models of Female Labor Supply," unpublished paper, University of Chicago, March 1977.

Heckman, James and Robert Willis, "A Beta-Logistic Model for the Analysis of Sequential Labor Force Participation by Married Women," *Journal of Political Economy*, 85, February 1977, 27-58.

Smith, James P., editor, *Female Labor Supply: Theory and Estimation*, Princeton University Press, forthcoming.

-----, "The Improving Economic Status of Black Americans," *American Economic Review*, March 1978.

Smith, James P. and Finis Welch, "Black-White Male Wage Ratios: 1960-1970," *American Economic Review*, June 1977, 323-338.

-----, "Inequality: Race Differences in Earnings," *International Economic Review*, forthcoming.

-----, "Race Differences in Earnings: Survey and New Evidence," in *Issues in Urban Economics*, Vol 2, P. Mieszkowski and M. Straszheim, editors, forthcoming.

Welch, Finis, "Education and Racial Discrimination," in *Discrimination in Labor Markets*, O. Ashenfelter and A. Rees, editors (Princeton: Princeton University Press, 1974).